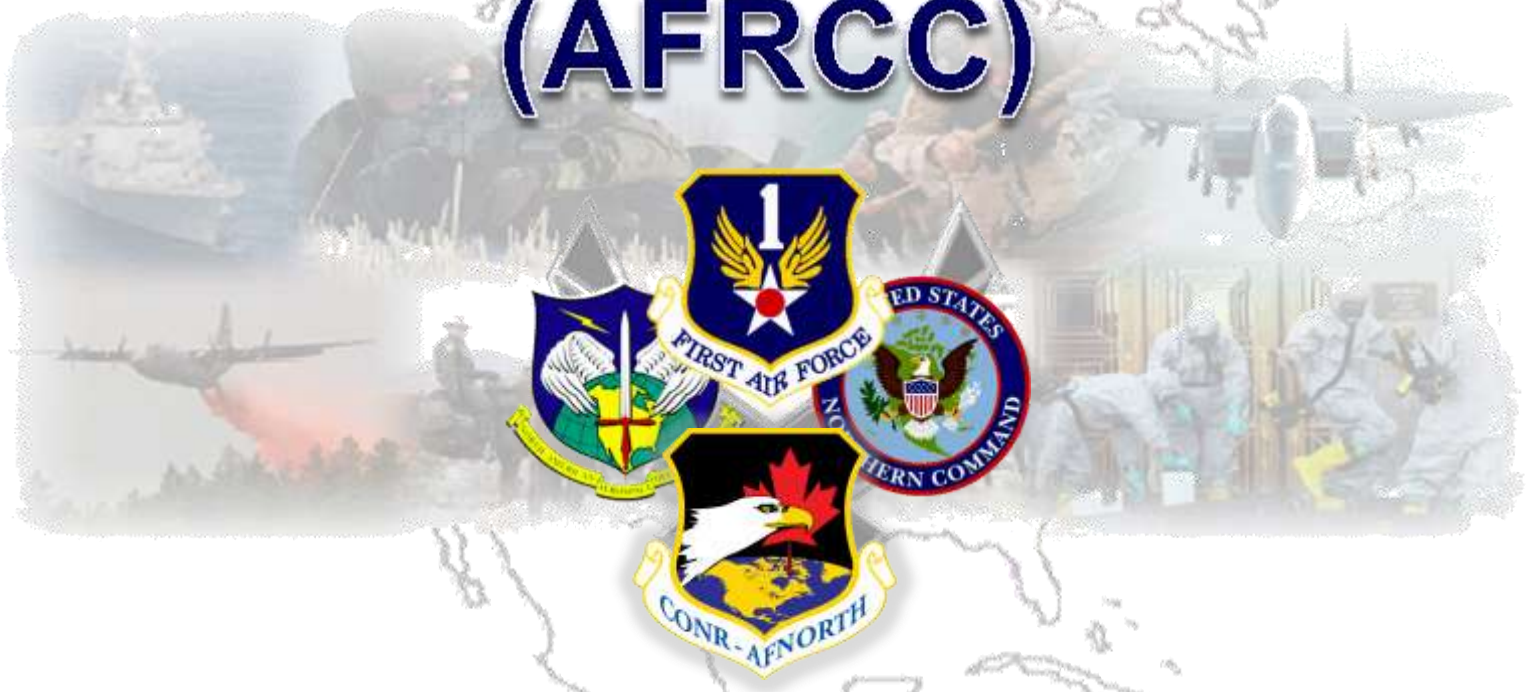
CONR - 1 AF (AFNORTH)

Air Force Rescue Coordination Center (AFRCC)



Overview

Agenda:

- **AFRCC Overview**
- **Mission Categories**
- **SAR Support – Federal**
- **Emergency Beacons – COSPAS/SARSAT**
- **Importance of Search Area Size**
- **Case Studies**

Presented by:

- **Lt Col Bob Russell, AFRCC**

Air Force Rescue Coordination Center (AFRCC)

Global Civil SAR System

IMO SAR Convention (1979)

ICAO Convention (1944)

Intl Aeronautical & Maritime SAR Manual (IAMSAR)

U.S. National SAR Plan

U.S. Nat'l SAR Supplement (NSS) to the IAMSAR Manual

USCG RCCs

USAF RCCs

AFRCC Mission Statement

CONTINUOUSLY BUILDING A COORDINATED SEARCH AND RESCUE NETWORK ENSURING TIMELY, EFFECTIVE LIFESAVING OPERATIONS WHENEVER AND WHEREVER NEEDED

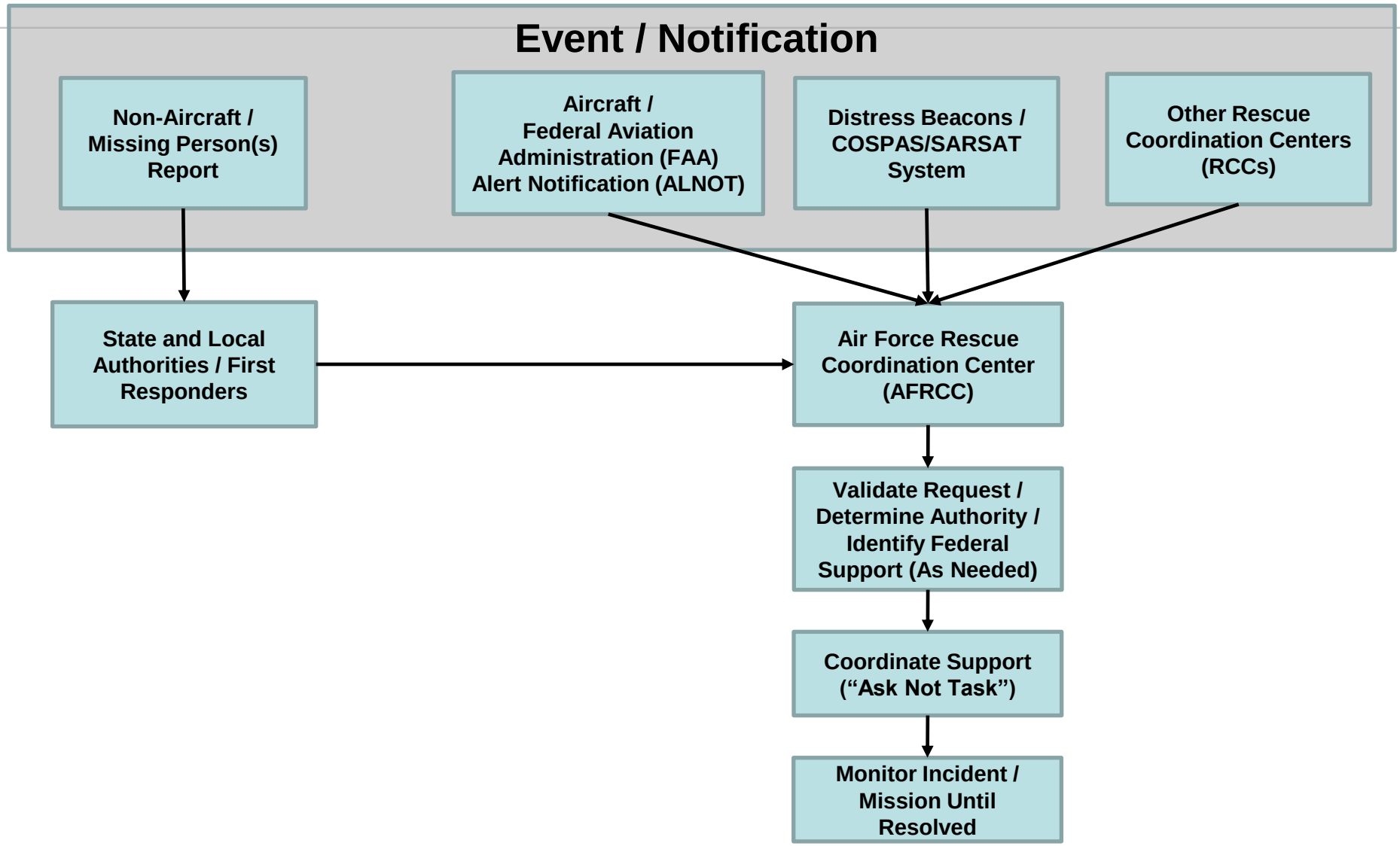
Cooperation – Coordination – Education.

AFRCC Charter

- Responsible for the coordination of all federal routine commercial, military, and interstate aeronautical SAR in the inland area of the United States
  - Assisting local, state, tribal and other federal agencies
  - Searching for missing/overdue aircraft
  - Managing all inland beacon searches
- 24-hour federal SAR brokerage
- No tasking authority – “Ask Not Task”
- Agreements with the 48 inland states for the coordination of SAR operations

Save life, limb, or eyesight; prevent undue suffering.

AFRCC Support to Civil SAR

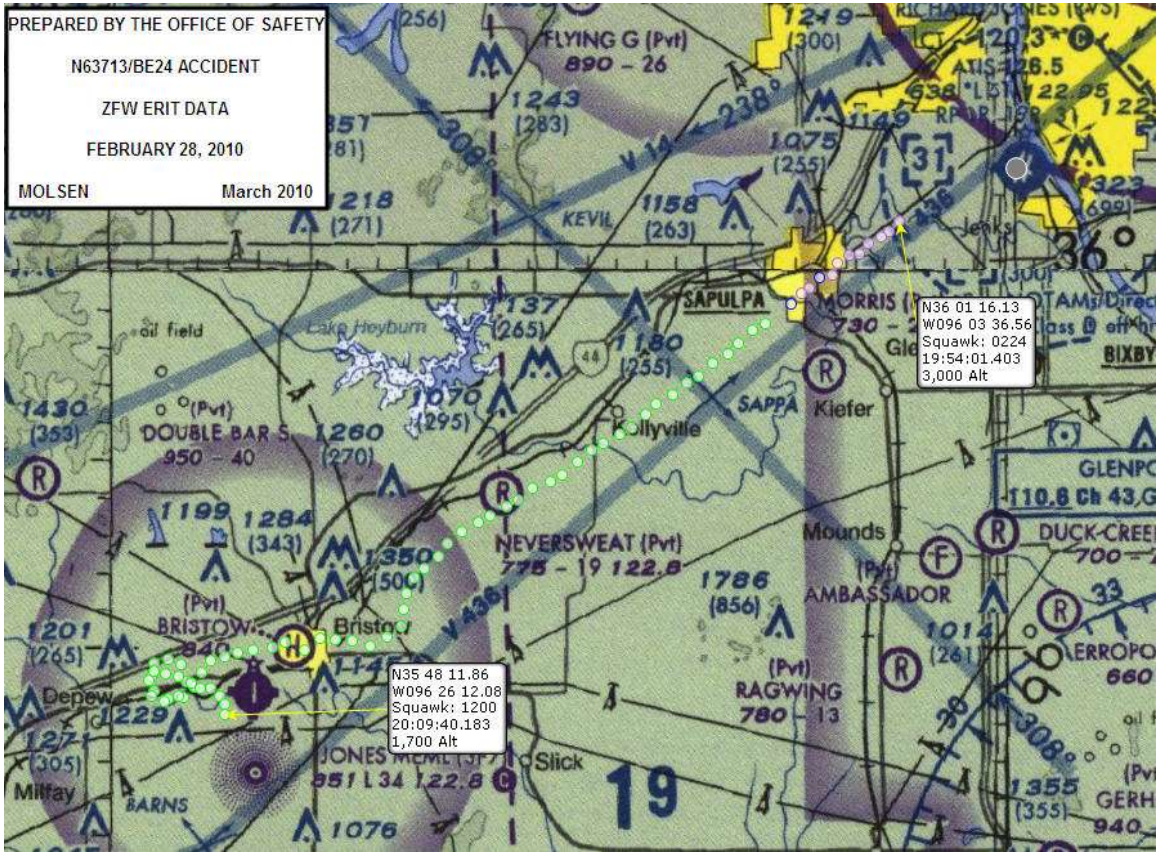


Emergency Beacons

- **COSPAS-SARSAT System**
- **Four Applications:**
  - **Maritime – Emergency Position Indication Radio Beacons (EPIRB)**
  - **Aviation – Emergency Locator Transmitters (ELT)**
  - **Personal – Personal Locator Beacons (PLB)**
  - **Shipboard Terrorism/Piracy Alerting (Covert) – Ship Security Alerting System (SSAS)**

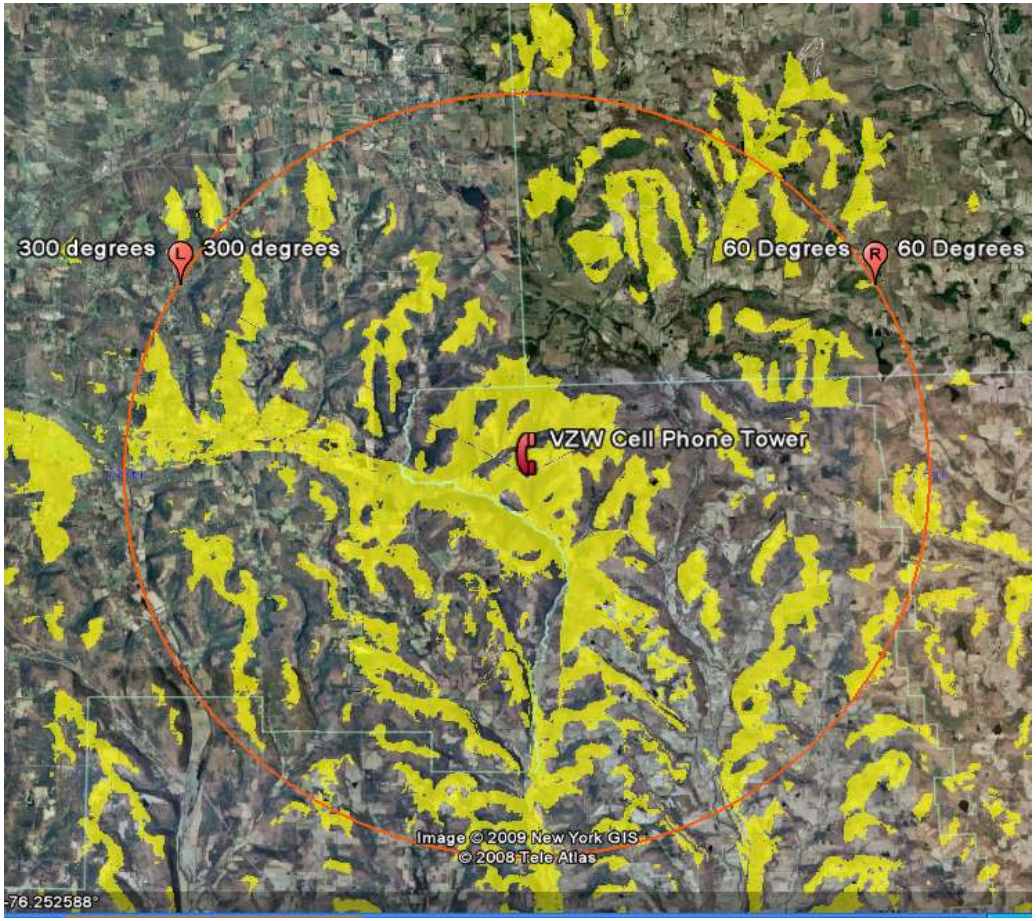
Radar Forensics

- **Tool for missing/overdue aircraft searches**
- **Sources:**
  - FAA
  - USAF
  - Civil Air Patrol
- **Results:**
  - Last Known Position (LKP)
  - Heading
  - Altitude
  - Speed
  - Maneuvers



Cell Phone Forensics

- **Tool for missing person or aircraft searches**
- **Civil Air Patrol cellular analysis expert**
- **Results:**
  - Recent activity (time)
  - Last Known Position (LKP)
    - Tower(s)
    - Range
    - Sector
    - GPS (if equipped)



The Product

STATE

ALNOT

FAA

SARSAT

ARTCC

SAR RESOURCES

FSS

WEATHER

MILITARY TOWER

LOCAL GOVERNMENT

FAMILY CONCERN

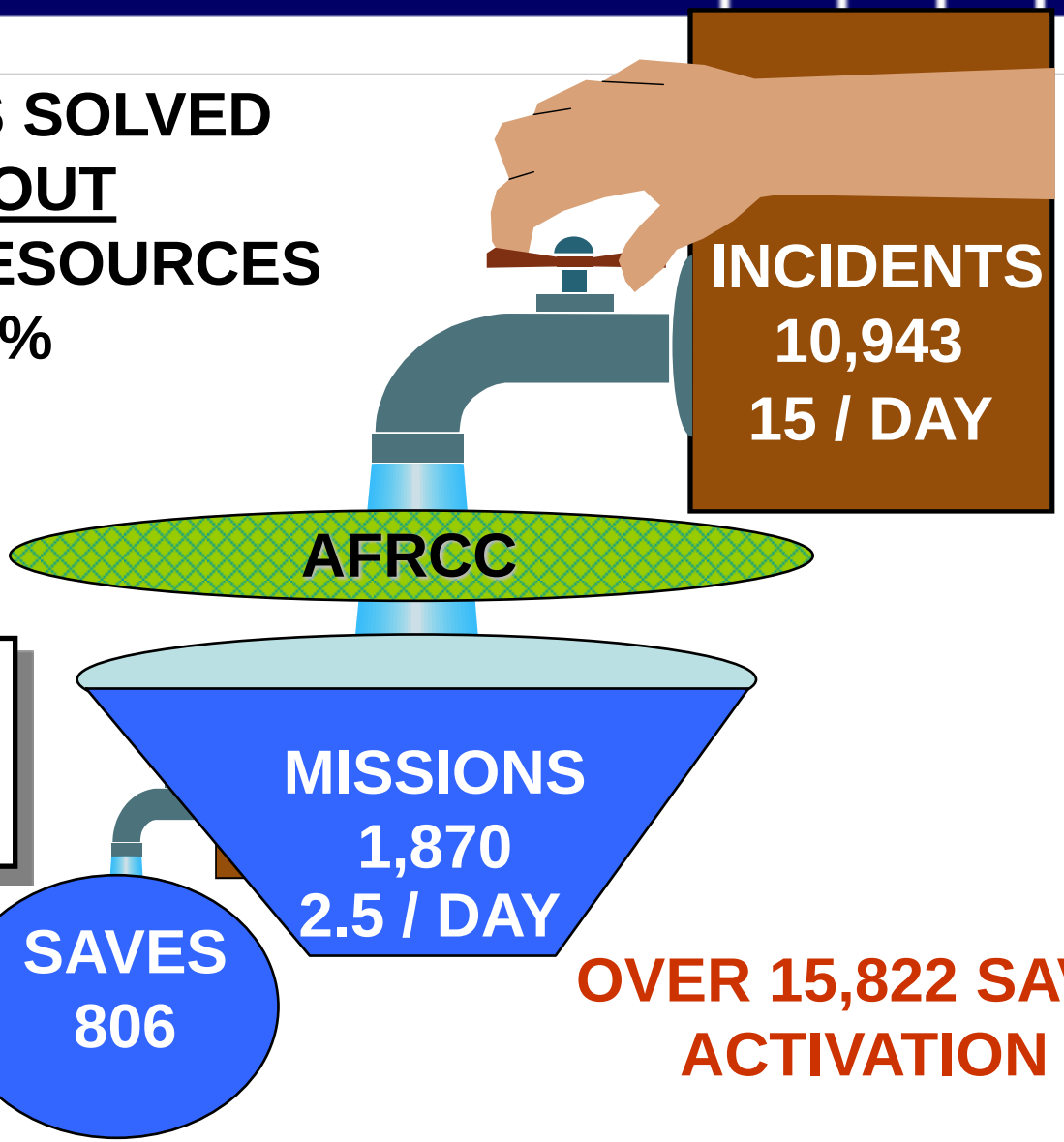
AFRCC
CONTROLLER

RIGHT INFORMATION
RIGHT RESPONDER
RIGHT TIME

The Goal → SAVE LIVES

Mission Activity 2010 & 2011

INCIDENTS SOLVED
WITHOUT
FEDERAL RESOURCES
~83%



1 LIFE EVERY DAY

OVER 15,822 SAVES SINCE ACTIVATION IN 1974

Mission Categories

Rescue

- Extraction from a known location, to prevent loss of life, limb, or eyesight

MEDEVAC/Patient Transfer

- Transport from a distress location / hospital to hospital transfer in a life or death situation

Mercy

- Blood and/or organ transport, used to prevent loss of life, limb, or eyesight

American Red Cross

Search

- Aircraft, Person, Vehicle, or Vessel

Precautionary

- Positioning of SAR forces for use during a scheduled activity where the potential for SAR is high

SAR Support - Federal

AFRCC Federal Partners

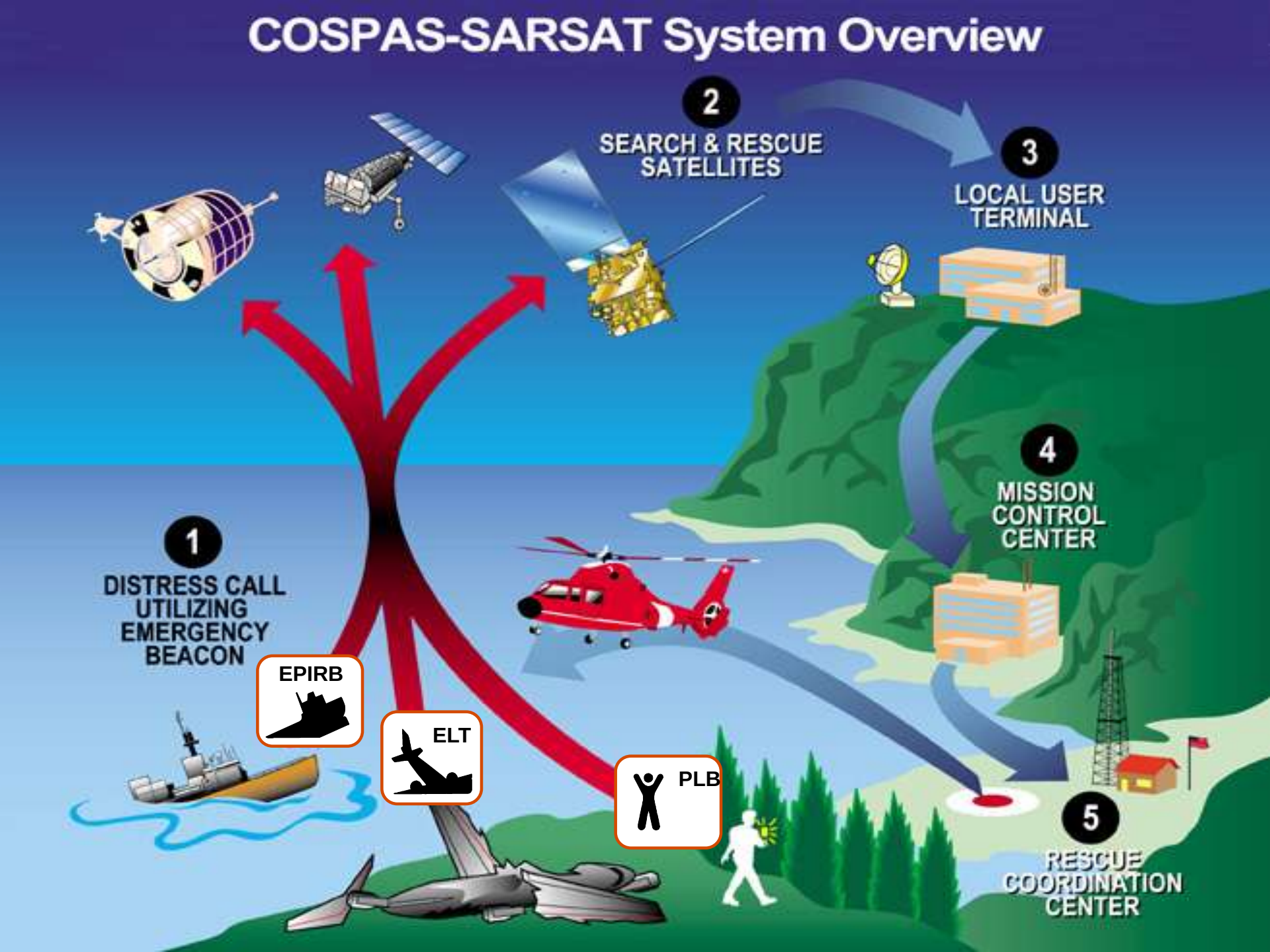
Emergency Beacons

COSPAS-SARSAT

It's about saving lives…

The Cospas-Sarsat Program protects life and property by providing accurate, timely, and reliable distress alert and location information to search and rescue authorities.

In short, Cospas-Sarsat works to take the "search" out of Search & Rescue


COSPAS-SARSAT System Overview
2
SEARCH & RESCUE SATELLITES
3
LOCAL USER TERMINAL
4
MISSION CONTROL CENTER
1
DISTRESS CALL UTILIZING EMERGENCY BEACON
EPIRB
ELT
PLB
5
RESCUE COORDINATION CENTER

COSPAS-SARSAT Participants

43 countries and 2 “organisations” participate

26 Ground Segment Providers operate ground receiving stations (Local User Terminals (LUTs)) and Mission Control Centres (MCCs) for the worldwide distribution of distress alerts

Beacon Evolution

- **1982:**
  - First Cospas satellite - Cospas-1 (USSR) launched in June
  - First rescue in September
- **1985:**
  - System declared operational
  - 406 MHz beacon technology arrives
- **Feb 2009: Cospas-Sarsat ceases satellite monitoring of 121.5 MHz**
- **May 2012: FAA cancels TSO-C91a**
  - No new 121.5 MHz ELT approvals
  - After 1 Dec 2012 all new ELT design approvals will require 406 MHz

Toronto Globe and Mail, 17 Sept 1982

Satellite plays rescue role

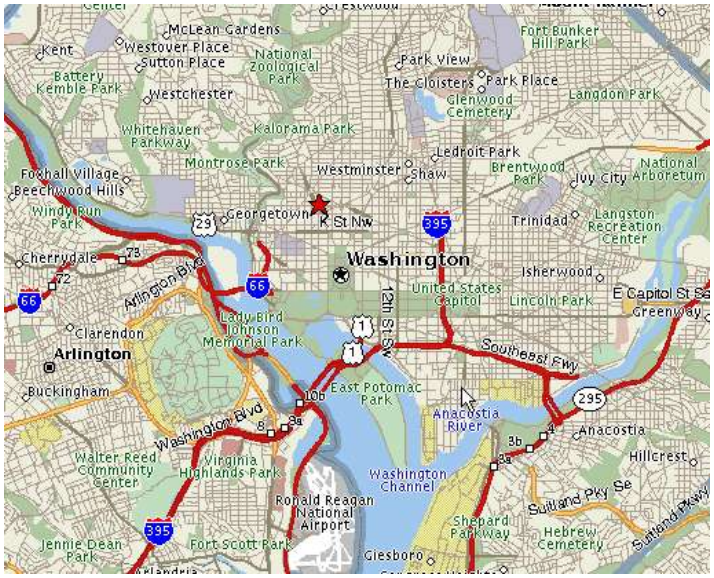
OTTAWA (CP) — Three Ontario men, whose light plane crashed in British Columbia last week, probably owe their lives to an orbiting Soviet satellite. In the first known rescue of its kind, the satellite picked up the automatic distress signal of the wrecked aircraft and pinpointed the site for Canadian search-and-rescue officials. Rescued and now recovering from cuts, bruises and broken ribs are pilot George [illegible] and passengers John [illegible] and Gary Van [illegible], all of Brampton. The satellite, launched June 30 by the Soviet Union, is the first link in what will eventually be an international search-and-rescue satellite system operated by the Soviets, Canada, the United States and France.

PRESS ACCOUNT OF FIRST SUCCESSFUL APPLICATION OF COSPAS-SARSAT SYSTEM, 10 SEPTEMBER, 1982

Location Accuracy

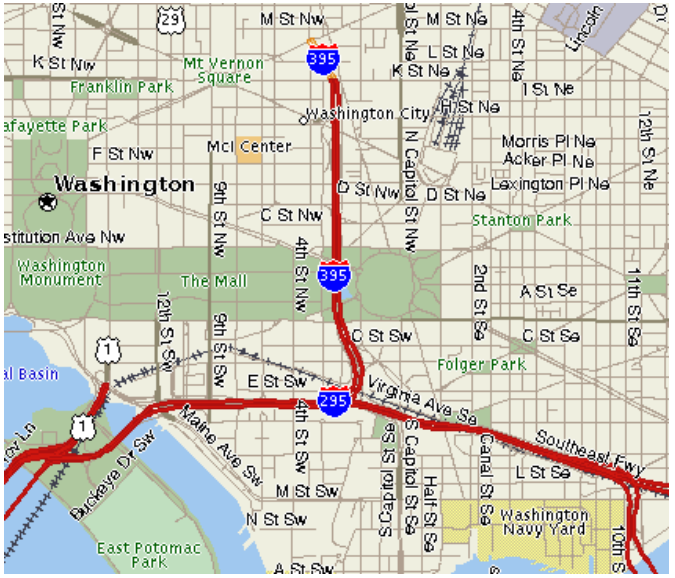
Comparison of 121.5 MHz vs 406 MHz

121.5 MHz



At 5000 Ft – Area of Approx 80 NM
Search Time = 12+ hours

406 MHz



Area of Approx 2 NM
Search Time = 2 - 3 hours

U.S. 406 MHz Beacon Users

U.S. 406 MHz Beacon Registration
(31 Dec 2011)

328,972	Total 406 MHz Beacons
178,751	406 MHz EPIRBs
57,263	406 MHz ELTs
92,709	406 MHz PLBs
249	406 MHz SSAS

Estimated 121.5 Population in U.S.

250,000	121.5 MHz ELTs

U.S. 406 MHz Beacon Users

Government & Military Use

The Military and Government use more than 65,000 beacons.

There is currently a large effort underway for transitioning to 406 MHz.

U.S. SARSAT Program Organization

Inland SAR

Maritime SAR

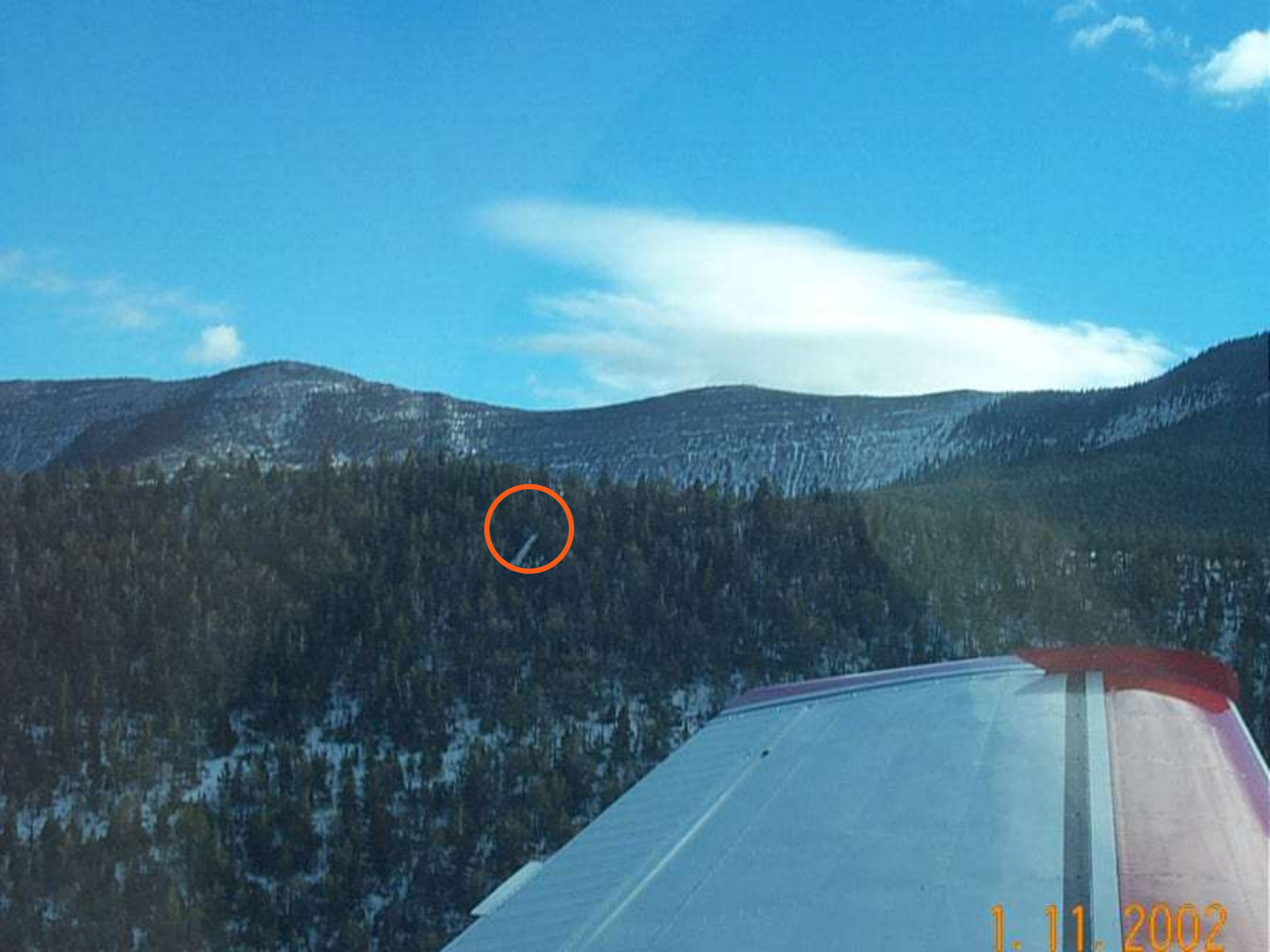
Research & Development

System Operation

Representative to International Cospas-Sarsat Program

Importance of Search Area Size

Smaller is Better … If Accurate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Case Studies

Case Study #1

- A beacon alert is passed from USMCC to AFRCC
- Beacon plotting 4 miles southwest of Rio Grande Gorge Bridge (near Taos, New Mexico)
- AFRCC contacted family (from beacon registration data) and confirm that a husband and wife are flying in New Mexico
- AFRCC contacted the nearest airport (Taos Regional Airport)
- Airport official reported that a bystander witnessed the crash and just called with the information
- AFRCC directed the local county sheriff to the site for rescue operations

Case Study #2

- A beacon alert is passed from USMCC to AFRCC
- Registration data not available (owner did not register the beacon so it was still under Cessna's general registration)
- AFRCC gathered data from an old incident that indicated the aircraft was located at Wichita Mid-Continent Airport, Kansas
- Airport tower contacted; confirmed that they could hear an ELT at their location
- Tower unable to locate the beacon so AFRCC opened a mission with Civil Air Patrol (CAP) to locate
- CAP located the aircraft on the ramp and beacon was silenced by the Airfield Manager

Case Study #3

- Fort Worth Air Route Traffic Control Center issued a family concern Alert Notice (ALNOT) for aircraft overdue into Smiley Johnson, Texas
- Radar forensic data provided by DoD, FAA, and CAP
- Cell-phone forensic data provided by CAP
- Forensic data indicated that aircraft was descending and heading directly for Smiley Johnson
- Information provided to Texas CAP; searched area with aircraft and ground teams
- Ground teams located the aircraft crash (1/4 mile from end of Smiley Johnson); pilot removed by local authorities
- Pilot suffered a broken leg and his dog was also found alive in the woods by the county sheriff department

Forum Challenges

- How to educate beacon owners/users the importance of proper registration and use
- ELT survival forensics:
  - ELT model
  - Did the ELT survive
  - Was it activated
  - Was the antenna connection intact
  - Did it play a role in life saving operations
- Updated aircraft crash survivability data
  - New types of aircraft have been issued airworthiness certificates
  - Current specifications based on 1970s crash studies

Questions

Commander – Lt Col Robert Russell (850-283-5084)

Director of Operations – Lt Col Jameson Dugdale (850-283-5029)

AFRCC Console (24/7 ops for civil SAR)

850-283-5955 or 800-851-3051

http://www.1af.acc.af.mil/units/afrcc/